HIGH-POWER COMPACT DISC PLAYER
WITH FM/MW/LW TUNER

PUISSANT LECTEUR DE CD
AVEC SYNTONISEUR FM/PO/GO

MASTER

PIONEER

OWNER'S MANUAL
MODE D'EMPLOI

Thank you for purchasing this PIONEER product. Before using this product, be sure to read this manual.

Nous vous remercions d'avoir acheté ce produit PIONEER. Avant de l'utiliser, prendre soin de lire ce manuel.

Vielen Dank für den Kauf dieses PIONEER Produkts. Diese Bedienungsanleitung vor der Inbetriebnahme sorgfältig durchlesen.

Muchas gracias por la adquisición de este producto PIONEER. Antes de tratar de operarlo, lea atentamente este manual.
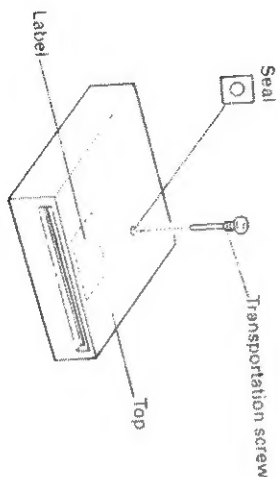
DEH-66

SPARE PARTS MASTER

Features

- Random play function to randomly select tracks.
- Auto-loading function to automatically load and play a disc when it is inserted into the CD player slot.
- Various selection functions (track number search, track scan, fast forward and reverse).
- Built-in highly sensitive "Automatic Reception Control" (ARC) for automatic control of stereo separation, muting, and frequency characteristics to match the strength of the FM signal.
- The Best Stations Memory automatically memorizes the six best (strongest) stations in the six preset buttons in the order of their strength.
- Versatile tuning system (preset, preset scan, seek, manual).
- 20 W + 20 W maximum output for sound with power to spare. Combination with separately available power amp unit allows configuration of a powerful 4-speaker system.

• **Electronic Tuner**
Frequency allocation differs depending upon the area. This unit has been designed in accordance with the frequency allocations for Western Europe, Asia, the Middle and Near East, Africa, Australia and Oceania. Use in other areas may result in improper reception of AM.

Note:
- A "CLASS 1 LASER PRODUCT" label is affixed to the bottom of the player. (Fig. 1) (Fig. 2)
- There is a screw on the top of the unit to protect the unit during transportation. Remove the screw before installing the unit and fix the seal supplied over the screw hole. Keep the screw because it must be used if you transport the unit later. (Fig. 2)

CLASS 1
LASER PRODUCT

Fig. 1

Seal

Label

Transportation screw

Top

Fig. 2

Secret Code

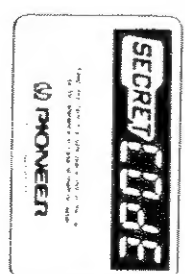This unit is equipped with a secret code function. The secret code (4-digit) electronically locks the unit to reduce the danger of theft. The code is preset to *0000* at the time of purchase, and the unit can be used normally without altering the code as preset. It is recommended, however, that the user change the code to another value to take full advantage of the anti-theft properties of this system.
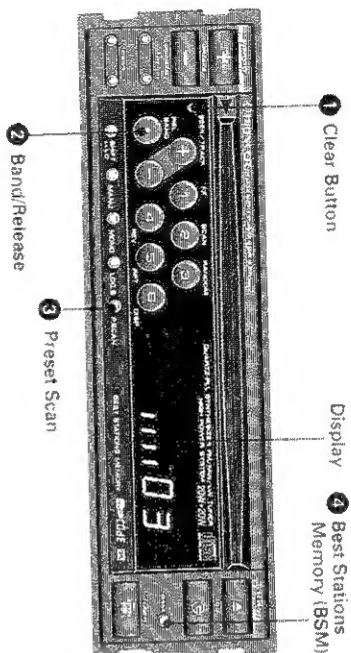
Once a code is set, the unit will operate normally without input of the secret code, even if the ignition of the vehicle is switched OFF and then ON again. Should power to the unit be interrupted due to a battery change, repairs, however, the unit will fail to operate when power is restored unless the preset secret code is first entered. Three consecutive wrong inputs of the code will cause the unit to lock electronically and accept no input of code for three hours. Once operation is restored, three more wrong code inputs result in another three hours of electronic lock up. This feature helps to prevent breaking of the secret code through sequential or random input. These features mean that once the power supplied to the unit is completely cut, further operation is impossible except for those who know the secret code. This makes the unit unusable if stolen, thus reducing the danger of theft.

* When taking the unit to a service station for repair, be sure to either tell the service personnel of the registered code or return the value to *0000*.

* Should you forget your registered secret number, consult your local service station taking along such proof of purchase and ownership as the original receipt, etc.

Accessory Sticker and Card

* Affix the sticker on a window of the vehicle in which the unit is installed to inform potential thieves of the anti-theft function of the unit.

* Write the secret code, unit model number, and unit serial number on the card and store it in a safe place outside of the vehicle itself. The serial number of this device is located on the bottom of the unit. This information can then be made available to the police and your PIONEER service station should your unit be stolen.

CAR AUDIO PROTECTION
SECRET CODE
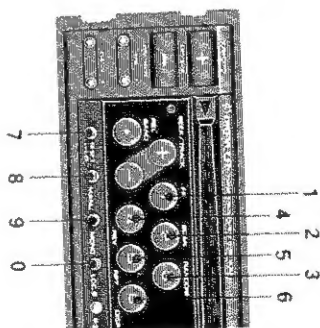PIONEER

SECRET CODE
PIONEER

3

Registering the Secret Code

The secret code should be registered after all connection and installation procedures are complete.

1. Switch the ignition key of the vehicle to ON or ACC.
   ❶ with a thin pointed object. Doing so causes $PASS$ to appear on the display for 1 minute. Press button

2. Press button ❷ while $PASS$ is shown on the display.
   The message $CODE$ will flash on the display to indicate that secret code registration is now possible. During this period, the buttons illustrated below become numeric input buttons (0–9) for the purpose of secret code registration.

3. Use the numeric input buttons to register the 4-digit secret number of your choice.

4. If an input error is made, simply reinput the correct secret code from the beginning. The last four values input are registered as the secret code.

● Clear Button

Display ❹ Best Stations
Memory (BSM)

❷ Band/Release

❸ Preset Scan

5. The entered value is registered as the secret code by pressing button ❸ after input is complete. The display will be cleared once this is done and normal operation of the unit will be possible.

Interruption of the Power Supply

Interruption of the power supplied to the unit caused by battery replacement or repairs to the unit causes the message $CODE$ to flash on the display once power supply is resumed and the ignition key of the vehicle is switched to ON or ACC. At this time the previously registered secret code should be entered using the following procedure:

1. Use the numeric input buttons (see "Registering the secret code") to enter the previously registered 4-digit secret code.

2. Press button ❸. The message $PASS$ will appear on the display for 1 minute, and normal operation will resume if the number entered matches the secret code registered before the power to the unit was interrupted. If the two numbers do not match, $CODE$ will flash on the display again and the unit will await input of the correct value.

Anti-theft Function

Three consecutive inputs of values which do not match the previously registered secret code activates an error timer causing the message Err to appear on the display. At this time, all operations, including further code input, become impossible for 3 hours (unless interrupted power supply). At the end of the 3-hour period, and the message $CODE$ appears on the display. The anti-theft function will operate for all subsequent input until the correct value is entered.

Changing the Secret Code

1. While pressing button ❹, turn the ignition key to ON or ACC.
2. The message $CODE$ will flash on the display, indicating that the unit is waiting for input of a secret code.
3. Use the numeric input buttons (see "Registering the secret code") to enter the previously registered 4-digit secret code.
4. Press button ❸. The message $PASS$ will appear on the display for 1 minute, and normal operation will resume if the number entered matches the secret code registered before the power to the unit was interrupted. If the two numbers do not match, $CODE$ will flash on the display again and the unit will await input of the correct value.
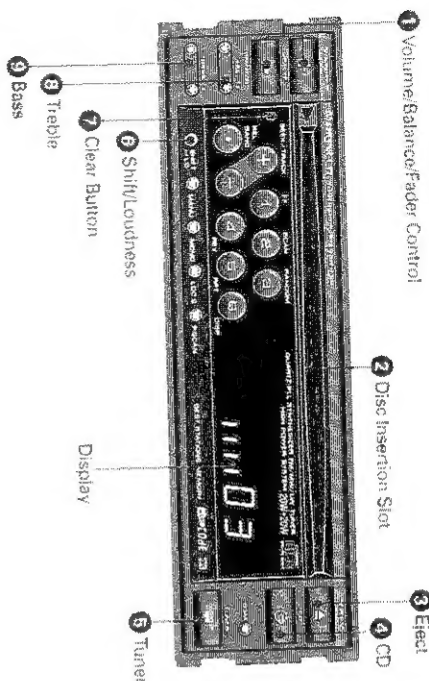
5. Press button ❷ while $PASS$ is shown on the display.
6. The message $CODE$ will flash on the display to indicate that it is now possible to change the registered secret code.
7. Use the numeric input buttons to register the 4-digit secret number of your choice.
8. The entered value is registered as the new secret code by pressing button ❸ after input is complete. The display will be cleared once this is done.

Precautions when Using 8-cm (3-inch) CDs

- Do not use an 8-cm (3-inch) CD without an adapter or an adapter without a disc in this player.
- When playing an 8-cm (3-inch) CD, use an adapter conforming to the recommended CD standard, or an adapter with the ...... mark.
- Read the instructions supplied with the adapter in order to fit the disc adapter to an 8-cm (3-inch) CD correctly before playing the disc. If the above precautions are not taken, the 8-cm (3-inch) CD may fail to play. The disc may be damaged or may get jammed in the player.

1. Volume/Balance/Fader Control
2. Disc Insertion Slot
3. Eject
4. CD
5. Tuner
6. Shift/Loudness
7. Clear Button
8. Treble
9. Bass

Display

message C O d E to appear on the display. Input the previously registered secret code at this time.

Switching Power On

Tuner
Press button 5 to switch the tuner power on. Press button 5 again to switch the power off.

CD Player
When a disc is inserted half-way into the disc insertion slot 2 with its label side upward, the disc is automatically loaded and played. Press button 4 to stop play. Press button 4 again to restart play from the beginning of the track at which play was stopped.

To eject the disc, press button 3.

- To change from disc mode to tuner mode, press button 5. To change from tuner mode to disc mode, press button 4.
- When the power is switched on, the display shows the volume for about 2 seconds.

Adjusting Volume, Balance and Fader
When the display indicates disc or tuner, press button 1 to adjust the volume. Each press of button 6 changes the display and the function of button 1 as follows:

Volume · Balance → Fader

Using the Clear button
Once all wiring is complete, press button 7 with a thin, pointed object. Though not a normal occurrence, the microprocessor which controls the operation of this unit can be affected by electrostatic noise. This generally is indicated by such symptoms as no power being supplied when you switch the unit on, failure of buttons and controls, or an abnormal display. Should this happen, press button 7 with a thin, pointed object to reset the microprocessor. Note that doing so also resets all audio controls, so you will have to make any desired settings again. This operation deletes all memory contents, such as frequencies stored in the preset memory, so you will have to make any desired settings again. Pressing this button causes the

Adjusting Volume

Pressing the (+) side of button ❶ increases the volume, while the (–) side decreases it.

```
Y - 15
```

Adjusting Balance

Pressing the (+) side of button ❶ shifts the balance to the left speaker, while the (–) side shifts it to the right speaker.

```
B - 0
```

Adjusting the Fader

This function controls the balance between the front and rear speakers of a 4-speaker system. Pressing the (+) side of button ❶ shifts the balance to the front speakers, while the (–) side shifts it to the rear speakers.

For 2-speaker systems, set F-0.

```
F - 0
```

Adjusting Bass and Treble

Adjusting Bass

Pressing the (+) side of button ❾ increases bass, while the (–) side decreases bass.

Adjusting Treble

Pressing the (+) side of button ❽ increases treble, while the (–) side decreases treble.

```
3
```

- When you're adjusting balance, fader, bass, or treble settings, the indicator will stop at the center setting. About 3 seconds after adjustment has been made, the display returns to its previous state.

Using the Loudness Function

Press button ❻ for about two seconds and the "LD" indication will appear on the display. This loudness function lets you enhance both high and low frequencies to give a more natural sound at low volumes. To cancel this function, press button ❻ again for about two seconds.

7

Using the Tuner

① Tuning/Local Seek Sensitivity

② Preset

③ Best Stations Memory (BSM)

Display

④ Tuner

⑩ Local Station
⑪ Seek
FM Stereo
⑨ Band/Release

⑧ Seek/Manual
⑦ FM Stereo/Mono
⑥ Local Station
⑤ Preset Scan

```
LOC    ☉            MONO
SEEK                      CH
FM ₁₁ 100.75 3
```

Band | Frequency | ⑬ Preset Number

1 Press button ④ to switch the tuner power on.

2 Press button ⑨ to select a band.
FMⅠ→FMⅡ→FMⅢ→M/L.
(FM1)   (FM2)   (FM3)   (MW/LW)
Use button ⑨ to switch between MW (531–1,602 kHz) and LW (153–281 kHz).

3 Use seek tuning to tune in a frequency.
Confirm that the "SEEK" indicator ⑪ is shown on the display (if not, press button ⑧).
Press the (+) side of button ① to automatically tune in the next higher receivable frequency, and the (−) side for a lower frequency.

4 Adjust volume and tone (see page 6).

5 Assign the tuned frequency to one of the buttons in bank ② (preset memory).
Press and hold down one of the buttons in bank ② for at least two seconds. The frequency is assigned to the selected button when the preset number ⑬ stops flashing on the display. Up to 18 FM stations (6 each for FMⅠ, FMⅡ and FMⅢ, and six MW/LW stations can be assigned to the preset memory buttons in bank ②.

6 Once a frequency is assigned to a button in bank ②, you just need to press that button to tune it in.
This also causes the number of the button pressed to appear at position ⑬ on the display.

Preset Scan Tuning

This function lets you automatically monitor the stations assigned to the preset buttons.

1. Press button ⑤ to make the channel ("CH") of the preset number ⑪ flash on the display.

   Each station assigned to the buttons in bank ② will be automatically tuned in for about eight seconds.

2. When you hear a station that you like, press button ⑤ again to cancel preset scan tuning and remain at that station.

BSM (Best Stations Memory)

This function automatically locates stronger stations and automatically assigns their frequencies to the buttons in bank ②, from strongest to weakest. It comes in handy when trying to find local stations while driving.

1. Press button ⑨ and select a band.

2. Hold down button ③. After about two seconds, a "beep" will sound to signal that the BSM search has started. At this time, "— — —" will flash on the display.

---

3. The frequency display will return once BSM search is complete, and frequencies are assigned to buttons 1 through 6 in bank ②.

- At the end of the BSM search, the displayed frequency is that assigned to button 1 of bank ②.

- If there are fewer than six strong stations in the area, some of the buttons in bank ② will not be assigned frequencies, so they will retain any frequencies assigned to them previously.

- BSM search may take as long as 30 seconds in areas where there are few strong stations.

- You can cancel BSM search by pressing button ⑨.

Manual Tuning

Use manual tuning when stations are too weak to be picked up by seek tuning.

1. Press button ⑥ to turn "SEEK" indicator ⑪ off.

2. Each press of the (+) side of button ① increases the frequency in 50 kHz steps in the FM band, 9 kHz in the MW band and 1 kHz in the LW band. Pressing the (−) side of button ① decreases the frequency. Holding down either side of button ① changes the frequency at high speed.

Switching between FM Stereo and Mono

Generally, it is best to allow the ARC (Automatic Reception Control) function to automatically set the optimum listening conditions. When there is a large amount of noise, you can press button ⑦ for clearer, mono reception ("MONO" ⑫ will appear on the display).

9

Adjusting Seek Sensitivity

The seek tuning function of this tuner lets you select between a local setting for reception of strong stations only, and a DX (distant) setting for reception of weaker stations. The local setting also has four seek tuning sensitivity levels for FM and two levels for MW/LW to match local conditions.

Changing the Local Seek Sensitivity

1. Use button ⑨ to select a band.
2. Hold down button ⑥ for more than two seconds to change to the local seek sensitivity display.

```
 ┌─────────────┐
 │   L O C 2   │
 └─────────────┘
```

(Example: LOC2)

3. While still holding down button ⑥, press the (+) side of button ① to increase the sensitivity level, and the (−) side to decrease the level as shown below.

FM : LOC1 ⇌ LOC2 ⇌ LOC3 ⇌ LOC4
MW/LW : LOC1 ⇌ LOC2

The LOC4 setting allows reception of only the strongest stations, while lower settings let you receive progressively weaker stations.

Switching between Local and DX

Press button ⑥ to switch between Local and DX (distant) seek tuning.

When "LOC" is shown on the display, seek tuning is performed with the local seek sensitivity. Otherwise, seek tuning is performed with the DX seek sensitivity.
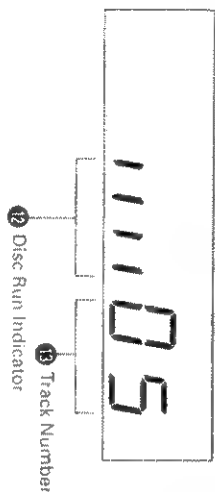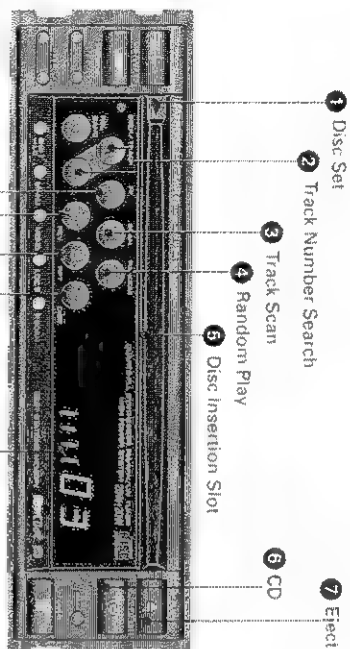
Note on LW Band Seek Tuning

The following shows changes in LW BAND broadcast frequency steps enacted by WARC/1979. The underlined italic figures indicate changes.

A. Up to January 1986
155· 164· 173· 182· 191· 200· 209· 218· 227· 236· 245· 254· 263· 272· 281

B. From February 1986
153·*162·171·180·189*·200·209·218·227·236·245·254·263·272·281

C. Form February 1988
153·162·171·180·189·*198·207·216·225·234*·245·254·263·272·281

D. From February 1990
153·162·171·180·189·198·207·216·225·234·*243·252·261·270·279*

The LW band seek operations of this unit are performed in 9 kHz steps starting from 155 kHz. In the case of B, the change results in the first five frequencies being shifted (2 kHz each) from A, while the remaining ten are identical to those of A. Consequently, manual tuning (in 1 kHz steps) and seek tuning should be used together to tune in the desired LW broadcast. It is also suggested that your favorite LW stations will be memorized for instant recall.

10

Playing Compact Discs

1. Disc Set
2. Track Number Search
3. Track Scan
4. Random Play
5. Disc Insertion Slot
6. CD
7. Eject
8. Display Change
9. Music Repeat
10. Reverse
11. Fast Forward
12. Disc Run Indicator
13. Track Number

Display

1 When a disc is inserted half-way into the disc insertion slot 5 with its label side upward, the disc is automatically loaded and played.

(Track number 13 and disc run 12 indications will appear on the display.)

2 Use track number search to select a track.

Press the (+) side of button 2 to increase the number at position 13 , or the (-) side to decrease the number. Holding either side of button 2 down changes the track number at high speed.

3 Adjust volume and tone (see page 6).

4 To stop CD play, press button 6.

You can restart CD play from the beginning of the track at which play was stopped by pressing button 6.

5 To eject or change the disc, press button 7.

If an ejected disc is pushed back into the slot, it will be loaded and played again.

Note:

- It takes a short time after a disc is loaded before it is played. This is because the CD player requires a setup time to read digital signals from the disc.

- When ▶ 1 is displayed, a disc is loaded. If another disc is inserted into the slot at this time, the discs may be damaged or the player may malfunction.

- Do not insert two discs into the slot at the same time. This may cause a malfunction.

11

Connecting the Units

- Before making final connections, make temporary connections, then operate the unit to check for any connecting cord problems.
- Refer to the owner's manual for details on connecting the various cords of the power amp and other units, then make connections correctly.
- Be sure to connect the memory power supply lead (orange) to a terminal that is always supplied with power regardless of the vehicle's ignition switch position. If this connection is made incorrectly or is forgotten, the unit will not work at all.
- Don't pass the orange lead through a hole into the engine compartment to connect to the battery. This will damage the lead insulation and cause a very dangerous short.
- Since a unique BPTL circuit is employed, never wire so the speaker leads are directly grounded or the left and right speaker (–) leads are common.
- Speakers connected to this unit must be high-power types possessing minimum rating of 20 W and impedance of 4 to 8 ohms. Connecting speakers with output and/or impedance values other than those noted here can damage the speakers.
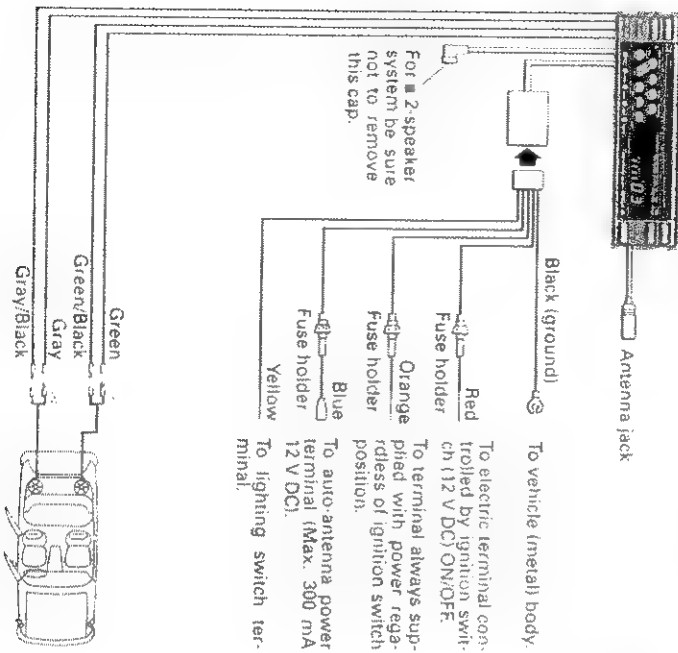
Last Track Memory

This player has a last track memory to restart play from the beginning of the track being played when the disc was stopped, ejected, and then loaded again.
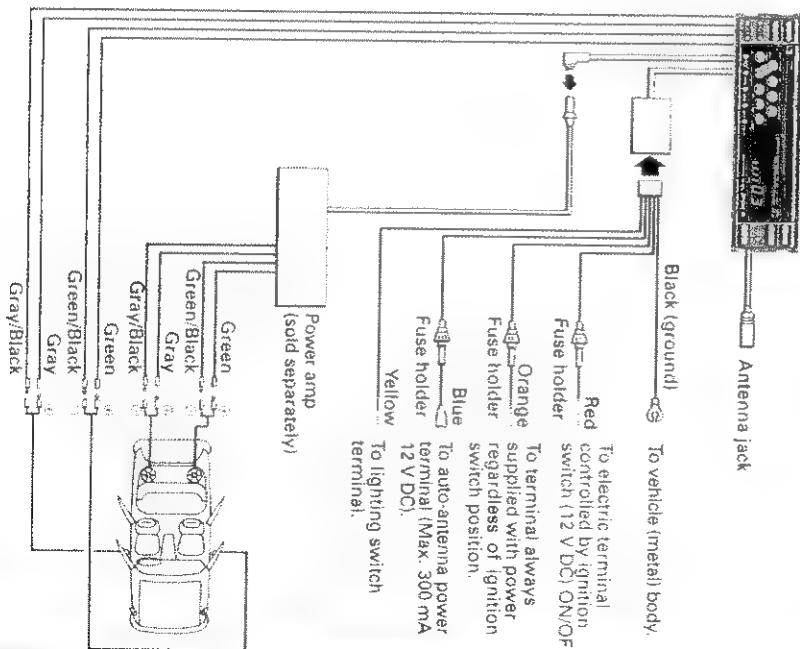
- When the disc is replaced with another, this function does not work, and play starts from the first track.

13

2-speaker system

Antenna jack

Black (ground)
To vehicle (metal) body.

Red
Fuse holder
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.

Orange
Fuse holder
To terminal always supplied with power regardless of ignition switch position.

Blue
Fuse holder
To auto-antenna power terminal (Max. 300 mA 12 V DC).

Yellow
To lighting switch terminal.

Green

Green/Black
Gray

Gray/Black

For a 2-speaker system be sure not to remove this cap.

4-speaker system

Antenna jack

Black (ground)
To vehicle (metal) body.

Red
Fuse holder
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.

Orange
Fuse holder
To terminal always supplied with power regardless of ignition switch position.

Blue
Fuse holder
To auto-antenna power terminal (Max. 300 mA 12 V DC).

Yellow
To lighting switch terminal.

Power amp
(sold separately)

Green
Green/Black
Gray
Gray/Black
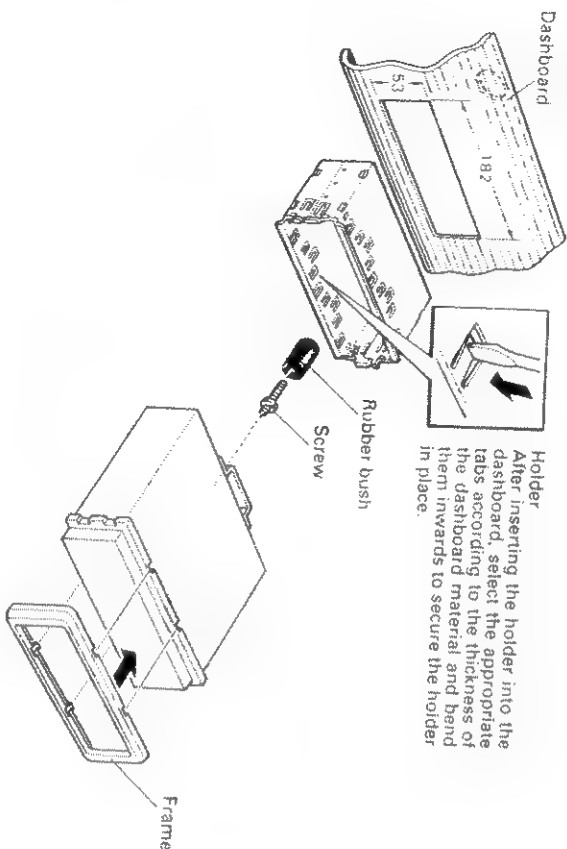Green
Green/Black
Gray
Gray/Black

Installation

ENGLISH

Note:
- Use only the parts included with the unit to ensure proper installation. The use of unauthorized parts can cause malfunctions.
- Consult with your nearest dealer if installation requires the drilling of holes or other modifications of the vehicle.

- If installation angle exceeds 30° from horizontal, the unit might not give its optimum performance. (Fig. 1)
- The semiconductor laser will be damaged if it overheats, so don't install the unit anywhere hot—for instance, near a heater outlet.
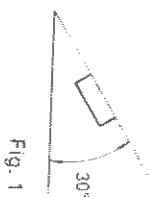
Fig. 1

30°

Installation with the rubber bush

Dashboard

53

182

Holder
After inserting the holder into the dashboard, select the appropriate tabs according to the thickness of the dashboard material and bend them inwards to secure the holder in place.

Rubber bush

Screw

Frame

15

Installation without the rubber bush

Drill a 5.5—6.0 mm diameter hole.

Dashboard

Nut (5 mm)

Screw (5 x 16 mm)

Nut (5 mm)

Screw

Strap
Be sure to use the strap to secure the back of the unit in place. The strap can be bent by hand to the desired angle.

Frame

Removing the unit

Insert the release pins into the holes in the bottom of the frame and pull out to remove the frame.

Lever
Position the accessory levers with the tabs pointing up. Insert the levers into the slots on both sides of the unit until they lock into place. Pulling off the levers makes it possible to remove the unit from the dashboard.

Tab

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Discs

- Only use compact discs (optical digital audio discs) bearing the mark shown below. (Fig. 1)
- Be sure never to touch the signal surface when handling discs. Pick up discs by grasping the outer edges or the edge of the hole and the outer edge. (Fig. 2) (Fig. 3)
- Do not affix paper or tape, and avoid scratching the side of the disc which contains the label (contents of disc). (Fig. 4)
- The disc revolves at high speed within the player unit, so defective (cracked or badly bent) discs should not be used. (Fig. 5) (Fig. 6)
- Dust and/or finger smudges will have no direct effect on the signal recorded on the disc, but dirt can decrease the amount of light

reflected from the recorded surface, thus affecting sound quality. If the disc should become soiled, gently wipe the surface with a soft lint-free cloth, wiping from the center of the disc to the edge. (Fig. 7)

- Do not use record sprays or antistatic agents. Such volatile chemicals as benzine and thinner can also damage the surface of the disc and should not be used. (Fig. 8)
- As with traditional audio records, compact discs are made of plastic. To avoid warping, keep the discs in their cases and do not store them in places exposed to direct sunlight. (Fig. 9)
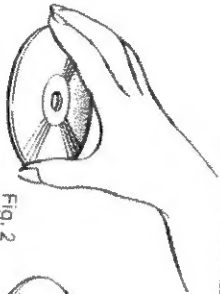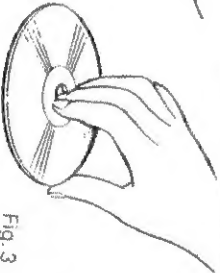
COMPACT disc DIGITAL AUDIO

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5
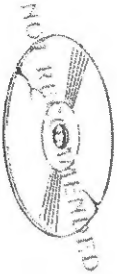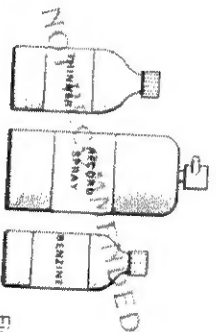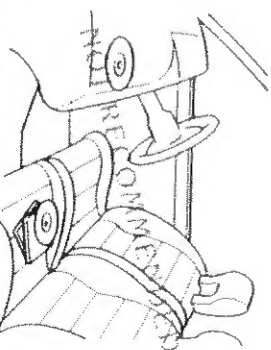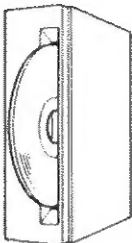
Fig. 6

Fig. 7

Fig. 8

Fig. 9

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Precautions

- To assure proper operation of the unit, keep the vehicle interior temperature within a normal range using the vehicle's air conditioner or heater.

- When replacing fuses, be sure to use only fuses of the rating prescribed on the fuse holder.

- To protect the semiconductor laser from damage, the CD player will automatically terminate disc play when its internal temperature rises past a standard level. When this occurs, $HHHH$ will appear on the display to indicate that the standard level has been exceeded. Eject the disc from the unit using the eject button and wait until the temperature returns to normal.

- Do not leave an ejected disc in the insertion slot for extended periods since direct sunlight can cause warping. Always return discs to their cases and store in areas not exposed to direct sunlight.

Discs should not be left like this for extended periods.

- When driving on an uneven road, the player may not reproduce every sound properly.

- Never remove the top case of the unit to attempt check or repairs. If operation of the unit is abnormal, contact your dealer or the nearest Pioneer Service Station.

- If the car's battery is disconnected for any reason, the preset memory will be erased and must be reprogrammed after reconnection of the battery.

- When driving your vehicle, be sure to keep the volume of the unit set low enough to allow you to hear sounds coming from outside.

Condensation

- During winter the inside of the vehicle may be very cold. If the heater is turned on and the player is used soon after, the disc or optical parts (prism, lens, etc.) may become misted up. If the disc is misted up, wipe it with a soft cloth. If the optical parts are misted up, wait for about an hour for them to warm up. They will return to their normal condition.

In case of trouble
When the unit does not operate properly, contact your dealer or the nearest authorized PIONEER Service Station.

18

Specifications

General
Power source .... 14.4 V DC (10.8–15.6 V allowable)
Grounding system .... Negative type
Max. current consumption .... 5.0 A
Dimensions (chassis) .... 180 (W) × 50 (H) × 150 (D) mm
   (nose) .... 170 (W) × 46 (H) × 16 (D) mm
Weight .... 1.8 kg

Amplifier
Max. power output .... 20 W + 20 W (EIAJ)
Continuous power output .... 11 W + 11 W
                 (1% dist. at 1 kHz)
Load impedance .... 4 Ω (4–8 Ω allowable)
Max. output level/
  output impedance (pre out) .... 250 mV/1 kΩ
Tone controls (bass) .... ± 10 dB (100 Hz)
     (treble) .... ± 10 dB (10 kHz)
Loudness contour .... + 10 dB (100 Hz), + 7 dB (10 kHz)
                  (volume: – 30 dB)

CD Player
System .... Compact disc audio system
Usable discs .... Compact disc
Signal format .... Sampling frequency: 44.1 kHz
              Number of quantization bits: 16; linear
Frequency characteristics .... 5–20,000 Hz (± 1 dB)
Signal-to-noise ratio .... 85 dB (1 kHz) (IEC-A network)
Dynamic range .... 87 dB (1 kHz)
Wow and flutter .... Below measurement range
Distortion factor .... 0.008% (1 kHz, 0 dB)
Number of channels .... 2 (stereo)

FM tuner
Frequency range .... 87.5–108 MHz
Usable sensitivity .... 12 dBf (1.1 µV/75 Ω, mono)
50 dB quieting sensitivity .... 17 dBf (1.9 µV/75 Ω, mono)
Signal-to-noise ratio .... 70 dB (IEC-A network)
             (at 65 dBf, 1 kHz, stereo)
Distortion .... 0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response .... 30–15,000 Hz (± 3 dB)
Stereo separation .... 40 dB (at 65 dBf, 1 kHz)

MW tuner
Frequency range .... 531–1,602 kHz
Usable sensitivity .... 18 µV (25 dB) (S/N: 20 dB)
Selectivity .... 50 dB (± 9 kHz)

LW tuner
Frequency range .... 153–281 kHz
Usable sensitivity .... 30 µV (30 dB) (S/N: 20 dB)
Selectivity .... 50 dB (± 9 kHz)

Note:
Specifications and the design are subject to possible modification without notice due to improvements.